

**Notice of Allowability**

Application No.

10/826,502

Applicant(s)

WEISS ET AL.

Examiner

Art Unit

Jerry Martin Blevins

2883

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed April 2, 2007.
2. ☒ The allowed claim(s) is/are 1-7, 9-16 and 18-36.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 4/16/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see pages 7-9, filed April 2, 2007, with respect to claims 1-5, 7, 9-14, 16, and 18-31 have been fully considered and are persuasive. The rejection of claims 1-5, 7, 9-14, 16, and 18-31 has been withdrawn.

### ***Allowable Subject Matter***

Claims 1-7, 9-16, and 18-36 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding independent claims 1 and 10, the prior art, as best exemplified by US 2002/0192680 to Chan et al., teaches a method and system for controlling one or more temperature dependent properties (namely reflectance spectra, paragraph 58, page 5) of a structure (a photonic band-gap microcavity, paragraph 58, page 5), the method and system comprising: heating (with a heating system that heats) at least a portion of a photonic band-gap structure (paragraph 76, page 7, wherein the photonic band-gap structure is silicon layers of a microcavity), and oxidizing (with an oxidizing system that oxidizes) the at least a portion of the photonic band-gap structure during the heating (paragraph 76, page 7) to alter at least one temperature dependent optical property of the photonic band-gap structure (paragraph 58, page 5). Chan does not expressly teach that the heating (with a heating system that heats) comprises annealing the at least a portion of the photonic band-gap structure. However, Chan does teach a

rather slow process of heating (over a 10 minute span, paragraph 76, page 7). After the heating process of Chan is complete, the device is allowed to cool (by the mere exclusion of maintaining heat). Presumably, the cooling process would likewise be a slow process, since Chan gives no hint at cooling in any method other than simply removing the heat. Therefore, this rather slow process of heating and cooling may reasonably be referred to as an annealing process. However, Chan, alone or in combination with the prior art, fails to disclose or render obvious that the annealing includes at least a warming stage for a first controlled period of time, a heating stage for a second controlled period of time, and a cooling stage for a third controlled period of time.

Claims 2-5, 7, 9, 29, 32, and 35 are allowed based on their dependence from allowed base claim 1.

Claims 11-14, 16, 18, 30, 33, and 36 are allowed based on their dependence from allowed base claim 10.

Regarding independent claim 19, the prior art, as best exemplified by Chan, teaches a photonic band-gap device (Figure 1) comprising: two or more first silicon layers; and two or more second silicon layers, wherein each of the first silicon layers adjacent one of the second silicon layers forms a period and wherein each of the second silicon layers has a higher porosity than the adjacent first silicon layer (page 3, paragraph 34); wherein two or more of the periods adjacent each other form a stack (stacks 10 including upper stack 12 and lower stack 14), wherein the stack is heated and oxidized (paragraph 76, page 7) to alter at least one temperature dependent optical

property of the stack (namely reflectance spectra, paragraph 58, page 5). Chan does not expressly teach that the heating comprises annealing the at least a portion of the photonic band-gap structure. However, Chan does teach a rather slow process of heating (over a 10 minute span, paragraph 76, page 7). After the heating process of Chan is complete, the device is allowed to cool (by the mere exclusion of maintaining heat). Presumably, the cooling process would likewise be a slow process, since Chan gives no hint at cooling in any method other than simply removing the heat. Therefore, this rather slow process of heating and cooling may reasonably referred to as an annealing process. However, Chan, alone or in combination with the prior art, fails to disclose or render obvious that the stack is annealed by at least warming the stack for a first controlled period of time, heating the stack for a second controlled period of time, and cooling the stack for a third controlled period of time. This process of warming, heating, and cooling, not suggested by Chan, alters the structure of the photonic band gap structure as it reduces stress that would otherwise arise due to a high thermal gradient.

Claims 20-24, 26-28, 31, and 34 are allowed based on their dependence from allowed base claim 19.

Regarding claims 6, 15, and 25, the prior art, as best exemplified by Chan, teaches the similar limitations as outlined above. However, Chan, alone or in combination with the prior art, fails to disclose or render obvious reflectance spectra of the photonic band-gap structure with a maximum shift of about  $\pm 0.5$  nm for a temperature change up to about 100 degrees Celsius.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMB

  
Frank G. Font  
Supervisory Patent Examiner  
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